

**[ABSTRACT OF THE DISCLOSURE]**

A method for forwarding an SMS message in a mobile communication system is disclosed. A calling mobile terminal requests transmission of an SMS message to an MC (Message Center) and the MC determines that a forwarding function is set for a  
5 called mobile terminal. If it is set, the MC transmits the SMS message to a destination mobile terminal.

**[REPRESENTATIVE FIGURE]**

**FIG 3**

**[TITLE OF THE INVENTION]**

METHOD OF FORWARDING AN SMS MESSAGE IN A MOBILE  
COMMUNICATION SYSTEM

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**[BRIEF DESCRIPTION OF THE DRAWINGS]**

FIG. 1 is a schematic view of a typical cellular mobile communication system;

10 FIG. 2 illustrates a conventional SMS message transmitting operation;

FIG. 3 is a flowchart illustrating an SMS message forwarding operation  
according to the present invention;

FIG. 4 illustrates an embodiment of the SMS message forwarding operation  
according to the present invention;

15 FIG. 5 illustrates another embodiment of the SMS message forwarding  
operation according to the present invention; and

FIG. 6 illustrates a third embodiment of the SMS message forwarding operation  
according to the present invention.

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**[DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT]**

**[OBJECT OF THE INVENTION]**

**[RELATED FIELD AND PRIOR ART OF THE INVENTION]**

25 The present invention relates generally to a mobile communication system, and  
in particular, to a method of forwarding an SMS message in a mobile communication

system.

FIG 1 is a schematic view of a typical cellular mobile communication system. Referring to FIG 1, a base station (BS) 20 connects radio channels with a mobile station (MS), i.e., mobile terminal 10 in each cell for communication. A  
5 mobile switching center (MSC) 30 receives subscriber information from a corresponding home location register (HLR) 40 and connects a call for the MS 10 to another subscriber system, for example, another MSC or the public switched telephone network (PSTN). The MSC 30 also interworks with at least one message center (MC) 50 that provides an SMS (Short Message Service)  
10 message to the MS 10.

The typical mobile communication system provides a forwarding service to allow a user to answer a call when he cannot use his mobile terminal. If the call forwarding is registered, a called mobile terminal forwards an incoming call to a predetermined destination terminal (e.g., a cellular phone or a PSTN phone).

15 Meanwhile, the typical mobile communication system provides an SMS service as an additional service. Due to the advantages of no constraint of call connection and convenience, SMS messages are increasingly used. However, these SMS messages are not forwarded even if a forwarding function is registered for a called mobile terminal.

20 FIG 2 illustrates a conventional SMS message transmitting operation.

Referring to FIG 2, when a calling mobile terminal requests transmission of an SMS message to a calling MC via a calling MSC, the calling MC translates a called number received from the calling mobile terminal and transmits the translated number to a corresponding called MC. A called MC applies to a corresponding called HLR for

information about a called mobile terminal. The called HLR searches for the subscriber information of the called mobile terminal. If a forwarding function is registered for the called mobile terminal, the called MC holds the SMS message or transmits it directly to the called mobile terminal. Therefore, a destination mobile terminal cannot receive the  
5 SMS message and, what is worse, the SMS message may be lost permanently.

Since the conventional SMS does not provide forwarding of SMS messages, an SMS message cannot be forwarded to a destination mobile terminal.

## 10 [SUBSTANTIAL MATTER OF THE INVENTION]

It is, therefore, an object of the present invention to provide a method of forwarding an SMS message to a destination terminal in a mobile communication system.

15 The above and other objects are achieved by providing an SMS message forwarding method in a mobile communication system. When a calling mobile terminal requests transmission of an SMS message to an MC (Message Center), the MC determines whether a forwarding function is set for a called mobile terminal. Unless the forward function is set, the MC transmits the SMS message to the called mobile  
20 terminal. If the forward function is set, the MC transmits the SMS message to a destination mobile terminal.

## [CONSTRUCTION AND OPERATION OF THE INVENTION]

Preferred embodiments of the present invention will be described hereinbelow with reference to the accompanying drawings. In the following description, well-known  
5 functions or constructions are not described in detail since they would obscure the invention in unnecessary detail.

FIG 3 is a flowchart illustrating an SMS message forwarding operation according to the present invention.

Referring to FIG 3, if a calling mobile terminal requests transmission of an  
10 SMS message to a calling MC via a calling MSC, the calling MSC translates a called number received from the calling mobile terminal, checks a corresponding called MC, and requests transmission of the SMS message to the called MC in step S10. In step S20, the called MC determines whether a forwarding function is set for a called mobile terminal referring to the subscriber information of the called mobile terminal from an  
15 HLR in which the called mobile terminal is registered.

Unless the forwarding function is set, the called MC transmits the SMS message to the called mobile terminal in step S30. On the other hand, if the forwarding function is set, the called MC checks a destination terminal and a destination MSC based on the subscriber information, particularly location registration information of the  
20 called mobile terminal in step S40 and forwards the SMS message to a destination MC via the destination MSC in step S50. Then, the destination MC applies to an HLR for the subscriber information of the destination mobile terminal and if the destination mobile terminal is capable of receiving the SMS message, it transmits the SMS message to the destination mobile terminal in step S60.

FIG 3 illustratively provides an outlined description of the SMS message forwarding procedure according to the present invention and many modifications can be made according to the types of destination terminals. Hereinbelow, there will be given a description of embodiments in this context.

5        FIG 4 illustrates an SMS message forwarding operation in the same system according to an embodiment of the present invention. In this embodiment, a forwarding occurs among a calling mobile terminal, a called mobile terminal, and a destination mobile terminal that are registered in the same mobile communication system. While an MS is connected to an MSC via a BS, the BS will be omitted for clarity of  
10 description.

Referring to FIG 4, the calling mobile terminal 10 transmits an SMS message transmission request message to the MSC 30 in step S110. The SMS transmission request message includes the contents of an intended SMS message and the MIN (Mobile Identification Number) of a called mobile terminal, that is, a called number. In  
15 step S120, the MSC 30 transmits the contents of the SMS message and the called number to the MC 50 to request transmission of the SMS message and the MC 50 stores the received information.

The MC 50 translates the called number and transmits a subscriber information request message to the HLR 40 in step S130. The HLR 40 searches a subscriber  
20 database using the called number for the subscriber information of the called mobile terminal. The subscriber information includes information about whether the called mobile terminal is registered for additional services, particularly information about whether an SMS message forwarding function is set for the called mobile terminal and information about a system in which the called mobile terminal is registered. The SMS

message forwarding function may be incorporated in a typical voice call forwarding function or set separately.

If the forwarding function is registered for the called mobile terminal, the HLR 40 searches the subscriber database for the subscriber information of a destination 5 mobile terminal 11 and transmits the subscriber information of the destination mobile terminal 11, particularly a destination number to the MC 50 in step S140.

In step S150, the MC 50 forwards the SMS message to the destination mobile terminal 11 in a known procedure.

FIG. 5 illustrates an SMS forwarding operation between different systems 10 according to another embodiment of the present invention. As shown in FIG. 5, a forwarding occurs among a calling mobile terminal, a called mobile terminal and a destination mobile terminal that are registered in different mobile communication systems.

Referring to FIG. 5, when the calling mobile terminal 10 requests transmission 15 of an SMS message to the calling MSC 30 in step S210, the calling MSC 30 transmits the contents of the intended SMS message and a called number to the calling MC 50 and the MC 50 stores the received information in step S220.

In step S230, the calling MC 50 checks a called mobile terminal based on the called number and requests transmission of the SMS message to a called MC 51 in 20 which the called mobile terminal is registered.

The called MC 51 requests the subscriber information of the called mobile terminal to a corresponding called HLR 41 in step S240. The called HLR 41 searches its subscriber database using the called number for the subscriber information of the called mobile terminal and determines whether the forwarding function is set for the

called mobile terminal. If the forwarding function is set, the called HLR 41 transmits the subscriber information of the destination mobile terminal 11 and the MC number of a mobile communication system in which the destination mobile terminal 11 is registered to the called MC 51 in step S250. In step S260, the called MC 51 requests  
5 transmission of the SMS message to a corresponding destination MC 53.

In step S270, the destination MC 53 requests the subscriber information of the destination mobile terminal 11 to a destination HLR 43 via a corresponding destination MSC 33. The destination HLR 43 searches its subscriber database for the subscriber information of the destination mobile terminal 11 and transmits the subscriber  
10 information to the destination MC 53 in step S280.

In Step 290, the destination MC 53 transmits the SMS message to the destination mobile terminal 11 in a known procedure.

In a third embodiment of the present invention, if a destination terminal is a PSTN phone that does not support character display, an MC converts the contents of an  
15 SMS message to voice and transmits the voice to an MSC in which the destination terminal is registered. The MSC transmits the voice to the PSTN phone.

FIG. 6 illustrates an SMS message forwarding operation to a PSTN phone according to the third embodiment of the present invention.

Referring to FIG. 6, the calling mobile terminal 10 transmits an SMS message  
20 transmission request message to the MSC 30 in step S310. Then, the MSC 30 transmits the contents of the SMS message and a called number to the MC 50 and the MC 50 stores the received information in step S320.

In step S330, the MC 50 translates the called number and requests the subscriber information of a called mobile terminal to the HLR 40. The HLR 40



searches the subscriber database for the subscriber information of the called mobile terminal and determines whether a forwarding function is set for the called mobile terminal. If the forwarding function is set and a destination terminal is a PSTN phone, the HLR 40 transmits the number of the destination terminal 15 to the calling MC 50 in  
5 step S340.

In step S350, the MC 50 transmits the number of the calling mobile terminal 10, the number of the destination terminal 15, and a voice message to a voice conversion server 70 to request transmission of the SMS message. The voice conversion server 70 interworks with a PSTN exchange 60 and converts the contents of the received SMS  
10 message to a voice message in the form of mechanical sounds.

After voice conversion is completed, the voice conversion server 70 requests routing to the destination terminal 15 to the PSTN exchange 60 in step S360. In step S370, the PSTN exchange 60 establishes a path to the destination terminal 15. If the destination terminal 15 hooks off in step S380, the PSTN exchange 60 notifies the voice  
15 conversion server 70 of the off-hook state. Then, the voice conversion server 70 transmits the converted voice message to the destination terminal 15 through the established path in step S390.

While the invention has been shown and described with reference to certain preferred embodiments thereof, it will be understood by those skilled in the art that  
20 various changes in form and details may be made therein without departing from the spirit and scope of the invention as defined by the appended claims.

**[EFFECT OF THE INVENTION]**

In accordance with the present invention as described above, an addition service such as SMS messages can be forwarded besides voice calls so that destination mobile terminals can receive registered additional services.

**[PATENT CLAIM(S)]**

- [CLAIM 1]** A method of forwarding an SMS (Short Message Service) message in a mobile communication system having at least one MSC (Mobile Switching Center) for providing communication services to a plurality of mobile terminals, and at least one MC (Message Center) interconnecting with the MSC for providing an SMS, comprising the steps of:
- requesting transmission of an SMS message from a calling mobile terminal to the MC;
  - 10 determining whether a forwarding function is set for a called mobile terminal in the MC;
  - transmitting the SMS message to the called mobile terminal if it is determined that the forwarding function is not set; and
  - transmitting the SMS message to a destination mobile terminal if it is
  - 15 determined that the forwarding function is set.

- [CLAIM 2]** The method of claim 1, wherein the requesting step comprises the steps of:
- requesting subscriber information of the called mobile terminal from an HLR
  - 20 (Home Location Register);
  - searching for the subscriber information of the called mobile terminal in the HLR; and
  - transmitting from the HLR to the MC the subscriber information of the destination terminal if it is determined that the forwarding function is set for the called
  - 25 mobile terminal.

**[CLAIM 3]** A method of forwarding an SMS (Short Message Service) message in a mobile communication system having at least one MSC (Mobile Switching Center) for providing communication services to a plurality of mobile terminals, and at least one  
5 MC (Message Center) interconnecting with the MSC for providing an SMS, comprising the steps of:

requesting transmission of an SMS message from a calling mobile terminal to a called MC via a calling MSC;

checking the subscriber information of a called mobile terminal in the called  
10 MC and requesting transmission of the SMS message from the MC;

searching for the subscriber information of the called mobile terminal and determining whether a forwarding function is set for the called mobile terminal in the called MC;

requesting transmission of the SMS message from the called MC to a  
15 destination MC if it is determined that the forwarding function is set; and

checking the subscriber information of a destination mobile terminal in the destination MC and transmitting the SMS message from the destination MC to the destination mobile terminal.

20 **[CLAIM 4]** A method of forwarding an SMS (Short Message Service) message in a mobile communication system having at least one MSC (Mobile Switching Center) for providing communication services to a plurality of mobile terminals, at least one MC (Message Center) interconnecting with the MSC for providing an SMS, a PSTN (Public Switched Telephone Network) exchange interconnecting with the MSC, and a

voice conversion server interconnecting with the PSTN exchange, comprising the steps of:

requesting transmission of an SMS message from a calling mobile terminal to the MC via the MSC;

5        searching for the subscriber information of a called mobile terminal and determining whether a forwarding function is set for the called mobile terminal in the MC;

requesting transmission of the SMS message from the MC to the voice conversion server via the PSTN exchange if it is determined that the forwarding  
10    function is set and a destination terminal is a PSTN phone;

converting the SMS message to a voice message in the voice conversion server and requesting establishment of a path to the destination terminal from the voice conversion server to the PSTN exchange; and

transmitting the converted voice message from the voice conversion  
15    server to the destination terminal after the PSTN establishes the path.

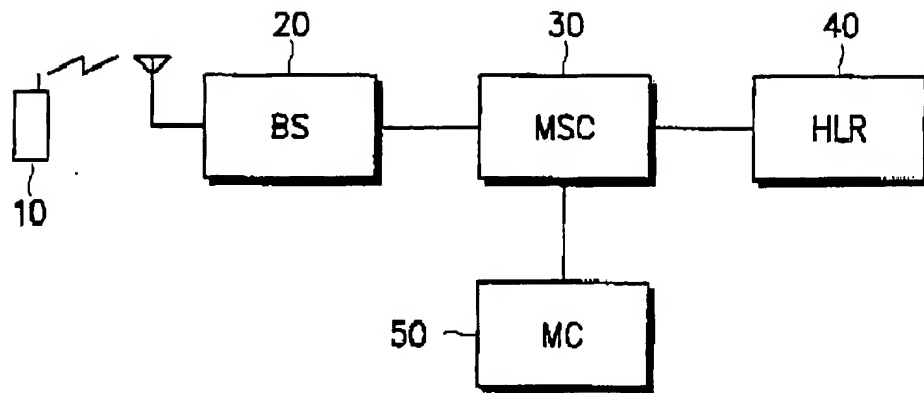


FIG. 1

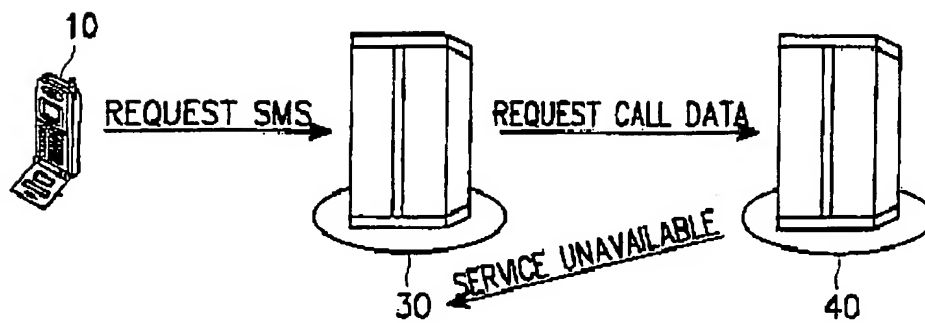


FIG. 2

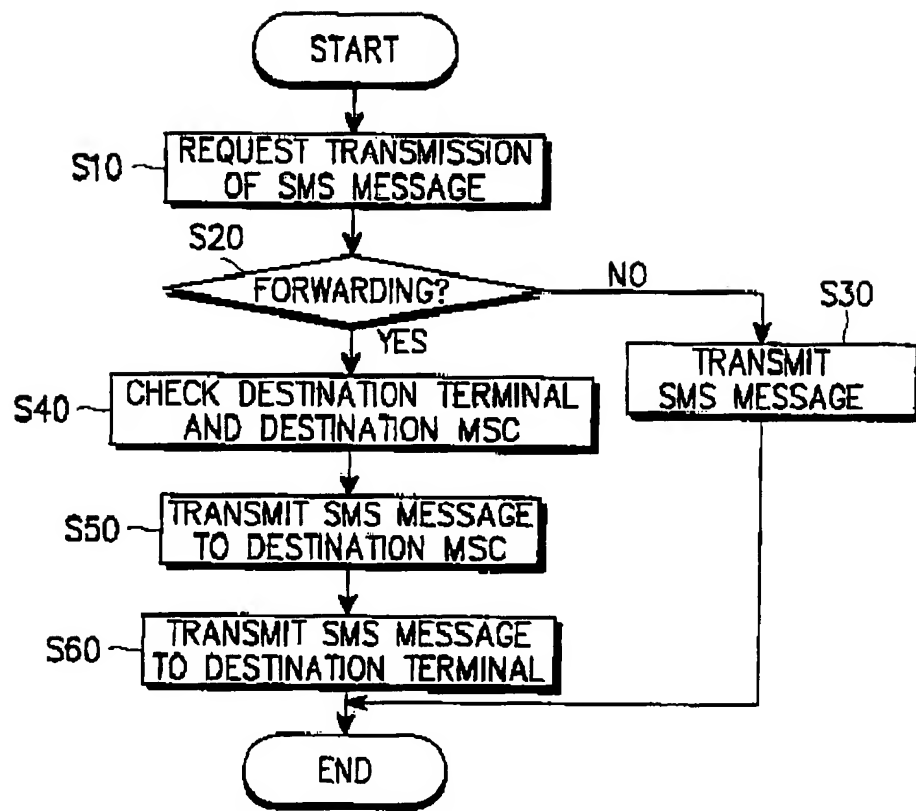


FIG. 3

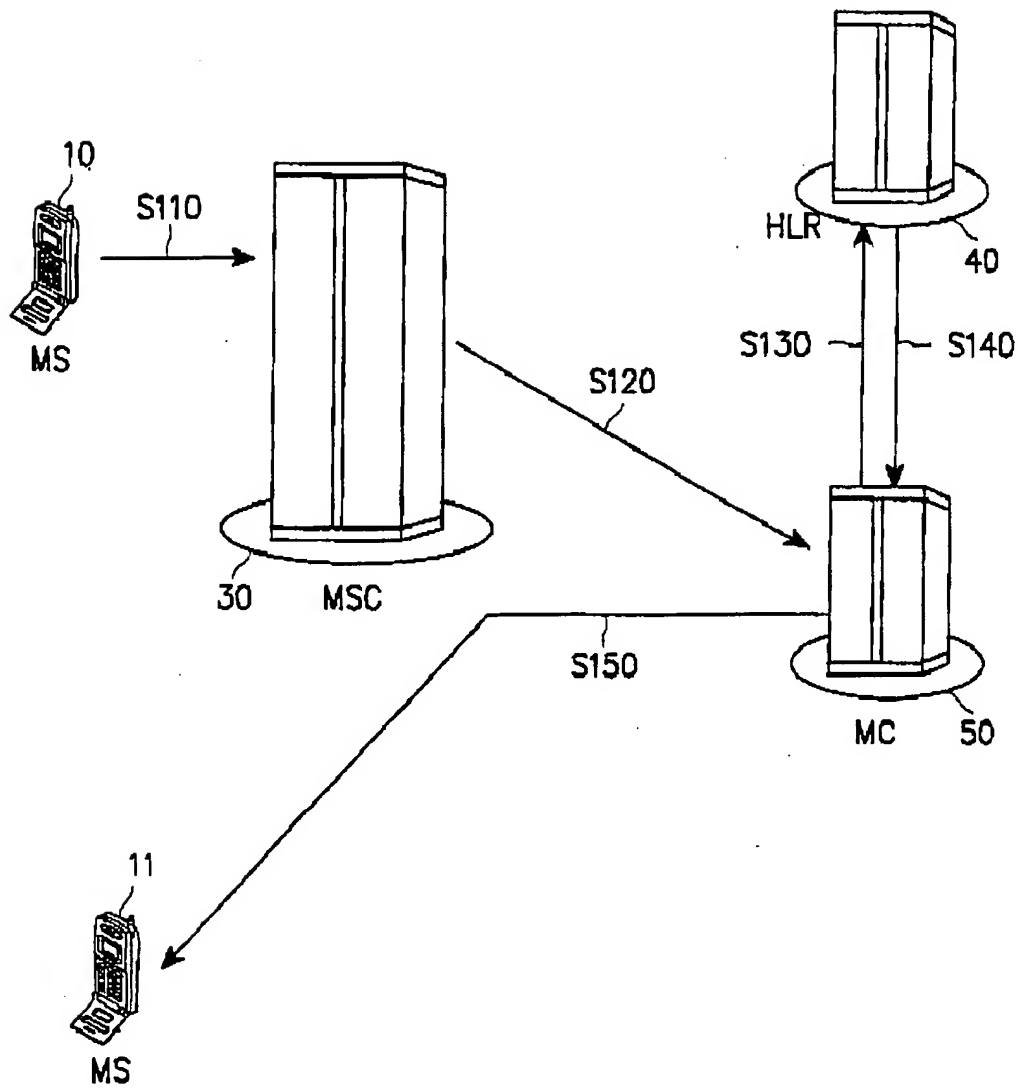


FIG. 4



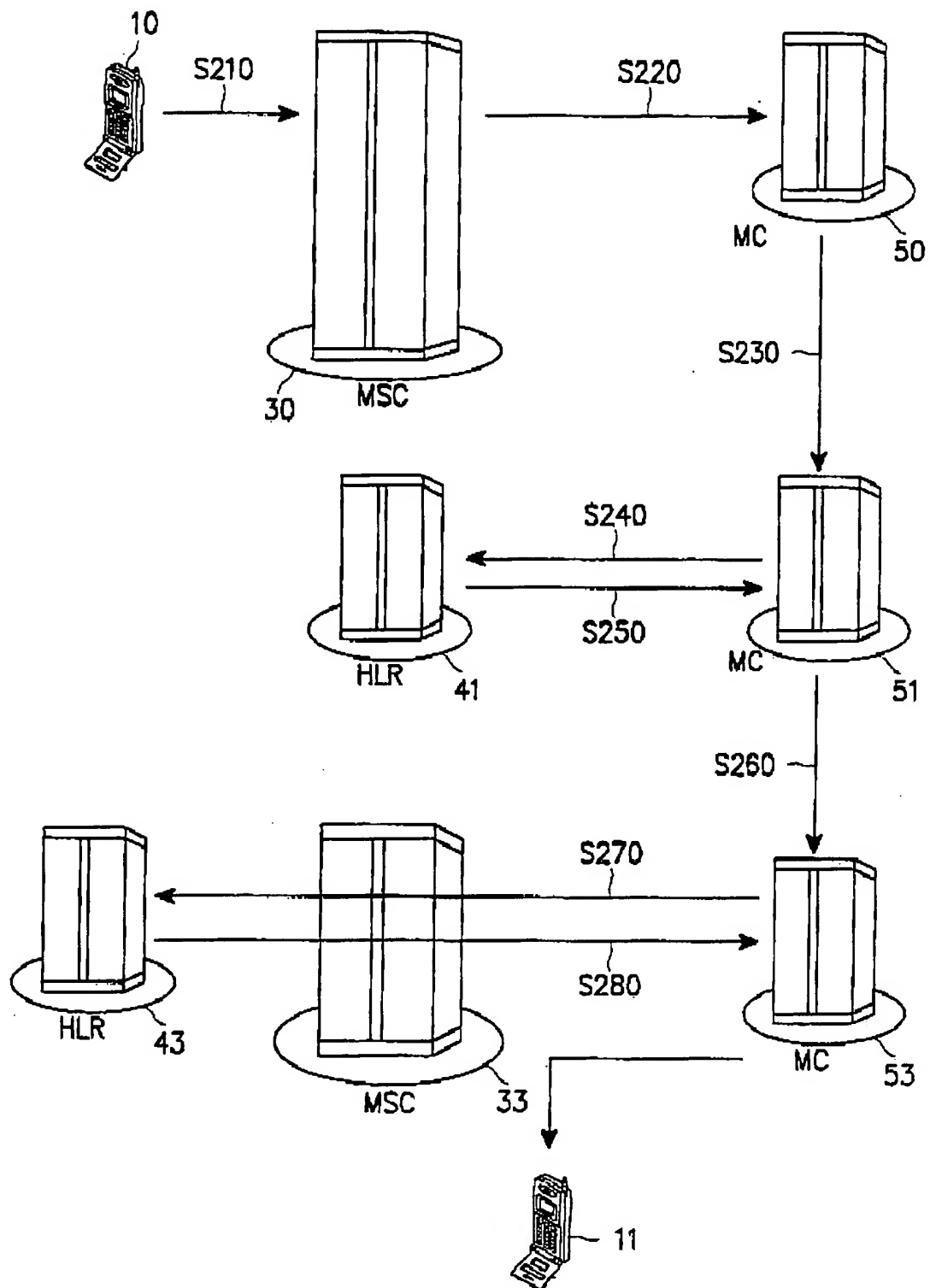


FIG. 5

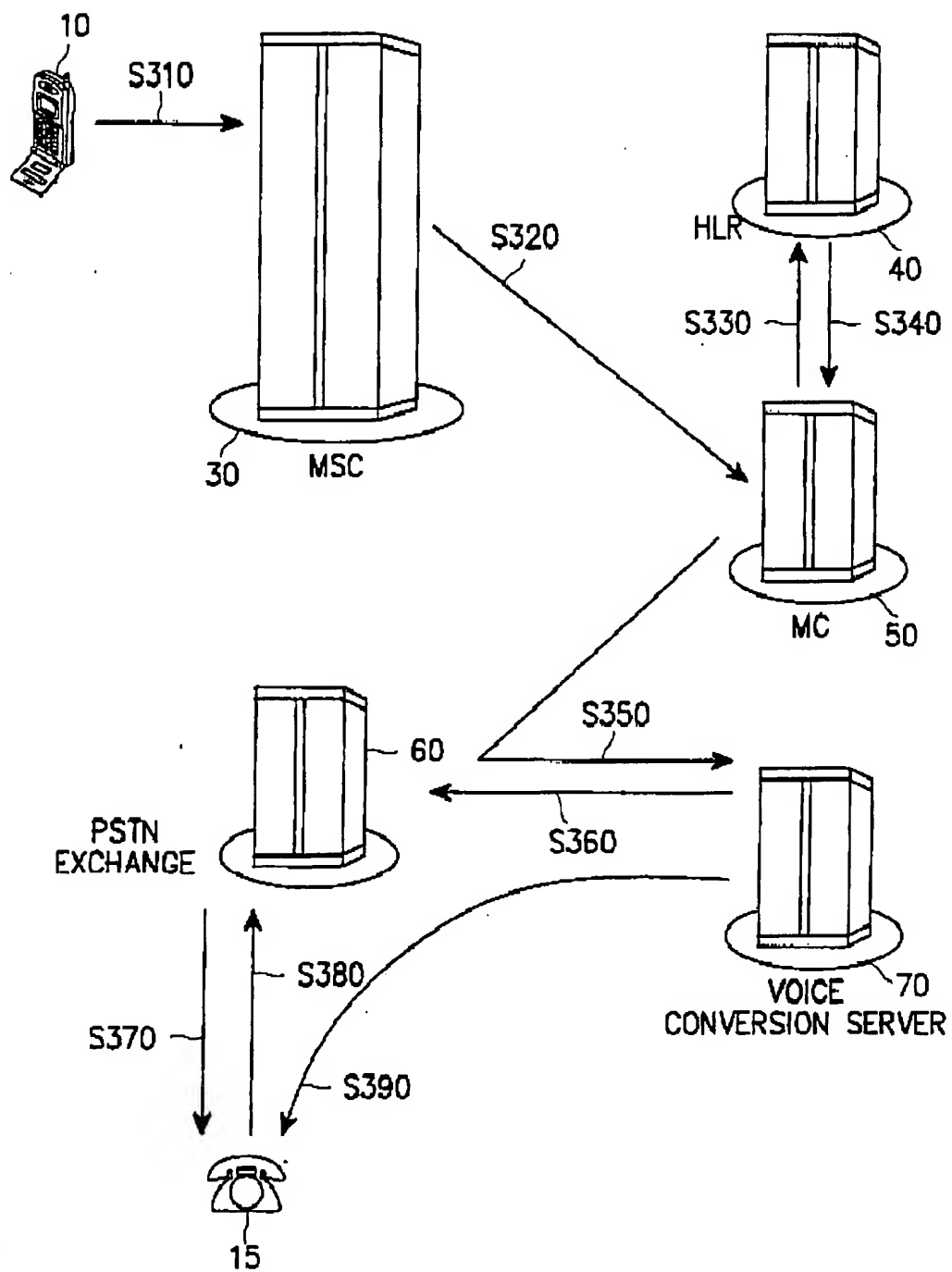


FIG. 6